

REMARKS

This is a full and timely response to the outstanding non-final Office Action mailed December 28, 2004 (Paper No. 20041220). Upon entry of this response, claims 2, 4-5, 8, 11, 14, 16-18, 21, 23-25, 29, 31-32 and 34-42 are pending in the application. In this response, Applicant has amended claims 2, 8, 14, 21, and 29. Applicant respectfully requests that the amendments being filed herewith be entered and request that there be reconsideration of all pending claims.

1. **Allowable Subject Matter**

Applicant acknowledges the Examiner's indication in the Office Action that claims 2, 4, 5, 8, 11, 14, 16-18, 21, 23-25, 29, 31, 32, and 34-42 are allowable. Although Applicant has amended independent claims 2, 8, 14, 21, and 29 in this response, Applicant respectfully assert that each of these claims remains in condition for allowance.

Applicant also appreciates the Examiner's indication that claim 39 would be allowable if rewritten in independent form to include all limitation of the base and intervening claims. However, Applicant has not amended dependent claim 39, since Applicant believes for at least the reasons discussed below that base claim 37 is allowable over the cited references.

2. **Rejection of Claims 34, 36-38, 40, and 41 under 35 U.S.C. §103**

Claims 34, 36-38, 40, and 41 have been rejected under §103(a) as allegedly obvious over *Tzannes* (U.S. 6,498,808) in view of *Helms et al.* (U.S. 6,144,695). Applicant respectfully traverses these rejections. It is well established at law that, for a proper rejection of a claim under 35 U.S.C. §103 as being obvious based upon a combination of references, the cited combination of references must disclose, teach, or suggest, either implicitly, all elements/

features/steps of the claim at issue. *See, e.g., In re Dow Chemical*, 5 U.S.P.Q. 2d 1529, 1531 (Fed. Cir. 1988); *In re Keller*, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981).

a. Claims 34 and 40

Applicant respectfully submits that claims 34 and 40 are allowable for at least the reason that the proposed combination of *Tzannes* in view of *Helms et al.* does not disclose, teach, or suggest at least the feature of “a tone ordering element configured to assign bits to at least a portion of the tones in an interleaved manner such that adjacent tones have different bit densities” as recited in claim 34, or the feature of “assigning data bits to at least a portion of the tones in an interleaved manner such that adjacent tones have different bit densities” as recited in claim 40.

The Office Action alleges that Table 1 of *Tzannes* “illustrates that each of a series of tones is associated with a bit density, and the number of bits assigned to each tone is different from the number of bits assigned to the adjacent tones, thereby resulting in different bit densities.” (Office Action, p. 2, paragraph 4; p. 4, paragraph 14.) Applicant agrees that the table is an illustration of an example BAT, and that in this example the bit density on one tone is different from the bit density for an adjacent tone. However, the BAT structure in *Tzannes* which is filled in with example bits and gains is not equivalent to Applicants’ claimed invention as defined by claims 34 and 40. Claims 34 and 40 each include language describing the procedure used to assign bits. The only description in *Tzannes* about how bits are assigned is that the number of bits assigned to each subchannel depends on the SNR of the subchannel. (Col. 2, lines 45-60.)

The Office Action also alleges that “*Helms et al.* disclose a tone ordering element 330 in the dual latency DMT system of Fig. 3A, considered to be configured to assign bits to at least a

portion of the tones in an interleaved fashion.” (Office Action, p. 4, paragraph 16.) Applicant will assume, *arguendo*, that tone ordering element 330 assigns bits in an interleaved manner. However, *Helms et al.* does not disclose, teach, or suggest that bits are assigned “such that adjacent tones have different bit densities” as recited in claims 34 and 40.

Helms et al. teaches, at most, conventional tone ordering according to ANSI T1.413. Applicant has enclosed, along with this Response, the relevant portion of T1.413 that describes tone ordering. This portion shows that bits and gains are typically stored by increasing tone number, while bits are assigned to tones in increasing order of bit density. (T1.413, Section 6.5 “Tone ordering.”) There is no discussion of ordering so that adjacent tones have different bit densities.

Accordingly, the proposed combination of *Tzannes* in view of *Helms et al.* does not teach at least the above-described features recited in amended claims 34 and 40. Since the proposed combination of *Tzannes* in view of *Helms et al.* does not teach at least the above-described features recited in amended claims 34 and 40, a *prima facie* case establishing an obviousness rejection by *Tzannes* in view of *Helms et al.* has not been made. Thus, claims 34 and 40 are not obvious under the proposed combination of *Tzannes* in view of *Helms et al.*, and the rejection should be withdrawn.

b. Claim 37

Applicant respectfully submits that claim 37 is allowable for at least the reason that the proposed combination of *Tzannes* in view of *Helms et al.* does not disclose, teach, or suggest at least the feature of “a tone ordering element comprising...logic for interleaving at least a portion of those bits assigned to adjacent tones” as recited in claim 37.

The Office Action alleges that “*Helms et al.* disclose a tone ordering element 330 and an interleaver 325 in the dual latency DMT system of Fig. 3A, and is considered to assign bits to tones, and interleave at least a portion of the assigned bits.” (Office Action, p. 3, paragraph 11.) Applicant respectfully disagrees, and asserts that the interleaver in *Helms et al.* cannot interleave bits assigned to adjacent tones since the interleaving occurs before bits are assigned to tones.

Helms et al. teaches, at most, conventional tone ordering according to ANSI T1.413. Applicant has enclosed, along with this Response, the relevant portion of T1.413 that describes interleaving and tone ordering. The element responsible for assigning bits to tones is the tone orderer. (T1.413, Section 6.5 “Tone ordering.”) The transmitter reference diagram shows that the tone-orderer is placed after the interleaver. (T1.413, Figs. 2 and 3.) With this arrangement, the interleaver has no “bits assigned to tones” to operate on. The section describing the interleaver itself is consistent with this understanding, describing the interleaver as operating on Reed-Solomon codewords, not on bits assigned to tones. (T1.413, Section 6.4.2 “Interleaving.”)

The Office Action admits that *Tzannes* does not expressly disclose “a tone ordering element comprising...logic for interleaving at least a portion of those bits assigned to adjacent tones.” (Office Action, p. 3, paragraph 10.) Accordingly, the proposed combination of *Tzannes* in view of *Helms et al.* does not teach at least the above-described features recited in claim 37. Since the proposed combination of *Tzannes* in view of *Helms et al.* does not teach at least the above-described features recited in amended claim 37, a *prima facie* case establishing an obviousness rejection by *Tzannes* in view of *Helms et al.* has not been made. Thus, claim 37 is not obvious under the proposed combination of *Tzannes* in view of *Helms et al.*, and the rejection should be withdrawn.

3. Rejection of Claim 35 under 35 U.S.C. §103

Claim 35 has been rejected under §103(a) as allegedly obvious over *Tzannes* (U.S. 6,498,808) in view of *Helms et al.* (U.S. 6,144,695). Since claim 34 is allowable, Applicant respectfully submits that claim 35 is allowable for at least the reason that it depends from an allowable claim. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d1596, 1598 (Fed. Cir. 1988). Therefore, Applicant respectfully requests that the rejection of claim 35 be withdrawn.

CONCLUSION

Applicant respectfully requests that all outstanding objections and rejections be withdrawn and that this application and presently pending claims 2, 4-5, 8, 11, 14, 16-18, 21, 23-25, 29, 31-32 and 34-42 be allowed to issue. If the Examiner has any questions or comments regarding Applicant's response, the Examiner is encouraged to telephone Applicant's undersigned counsel.

Respectfully submitted,

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